

Japanese Published Unexamined (Kokai) Patent Publication No. H4-140655; Publication Date: May 14, 1992; Application No. H2-260387; Application Date: October 1, 1990; Int. Cl.<sup>5</sup>: G01N 27/12 1/22 27/12 33/32; Inventor: Yasuko Kumano; Applicant: Fujita Co., Ltd.; Japanese Title: Toryou Shuuki Sokutei Houhou (Method for Measuring Odor of Paint)

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## Specification

### 1. Title of Invention

Method for Measuring Odor of Paint

### 2. Claim

A method for measuring odor of paint, characterized in that after a sample has been produced by applying a paint onto a plate base piece, the sample is installed in a sample chamber of an odor measuring device equipped with a temperature sensor, a humidity sensor, a heater controlled by each sensor, a freezer and a humidifier to measure the intensity of the odor after the application of the paint.

### 3. Detailed Description of the Invention

#### [Field of Industrial Application]

This invention pertains to an odor measuring method generated from a surface with paint applied.

#### [Prior Art]

At an odor measuring during a paint application, a gas generated from a paint applied area is collected in a paint applying location. The components of odor of the paint

are examined at a laboratory using a detector tube for various gases or a gas chromatography.

As for the intensity of the odor, a three-point comparing odor measuring method for measuring a collected gas by the sense of smell of the human is generally used.

#### [Problem of the Invention to Be Solved by the Invention]

The odor during a paint application cannot usually readily be measured as a gas generated from a paint applied location needs to be collected at the actual application site.

In addition, the error in the three-point comparing odor measuring method is significant due to an individual difference in the sense of smell. Since a certified person is required for the measuring, the three-point comparing odor measuring method is not a general method.

Furthermore, there are no commercially available smell sensors that are capable of measuring the odor intensity while the temperature and the humidity during the measuring are controlled.

The invention is proposed in consideration of such a situation. The purpose of the invention is to offer a measuring method for paint odor that can effectively measure the odor of the paint under reproduced environmental conditions for an application site.

#### [Measures for Solving the Problem]

In order to achieve the aforementioned purpose, according to the method for measuring odor of paint, after a sample has been produced by applying a paint onto a plate base piece, the sample is installed in a sample chamber of an odor measuring device

equipped with a temperature sensor, a humidity sensor, a heater controlled by each sensor, a freezer and a humidifier to measure the intensity of the odor after the application of the paint.

#### [Effect]

As described above, according to the invention, a drying process as similarly to as in the actual application is applied to the paint by installing the produced sample with the paint applied on the plate base piece inside the sample chamber of the odor measuring chamber, thereby measuring the odor intensity at a high precision in a short period of time.

#### [Working Example]

The working example of the invention as illustrated in the drawings is described hereinbelow.

Reference number 1 refers to an odor measuring device body; 2 to a sample chamber, whose circumferential wall, ceiling and bottom are insulated using a heat insulator 3. A smell sensor 4, a temperature sensor 5 and a humidity sensor 6 are installed on the ceiling whereas a heater 7 is installed on the inner wall. A freezer 8 is also built into the sample chamber 2.

A temperature control device 9 and a humidity controlled device 10 are connected to the temperature sensor 5 and the humidity sensor 6. The heater 7 and the freezer 8 are operated by the temperature control device 9 that has received a detection signal of the temperature sensor 5.

A steam 12 is supplied into the sample chamber 2 by a humidifier 11 that has received a detection signal of the humidity sensor 6.

Reference symbol (A) refers to a sample, which is produced by applying a paint 14 of 0.02 g/cm<sup>2</sup> onto a square aluminum plate base piece 13 of 2.4 x 1.2 cm at a 0.1 cm thickness. As shown in Fig.4, the sample (A) is placed on watch glass 15 and supplied into the sample chamber 2 to measure odor generated from the paint 14 of the sample (A).

The heater 7 installed inside the sample chamber 2, the freezer 8 and the humidifier 11 installed adjacent to the sample chamber 2 are entirely controlled by the temperature sensor 5 and the humidifier sensor 6 and operated according to the installation values to set the atmosphere inside the sample chamber 2 at a desired state.

The measuring period is predetermined for 10 minutes from a supply of the sample (A) to the sample chamber 2.

Fig.5 and Table 1 illustrate the result of an odor measuring for water paints from two companies A and N at 24°C at a 60% humidity.

Table 1

Samples	0 hour later	0.5 hours later	1.0 hour later	1.5 hours later	2.5 hours later
Water paint from company N	[Please refer to the original description]				
Water paint from company A					

(Unit: Alb)

In a comparison of the water paints between company N and company A, the initial odor intensity of the water paint from company A is lower. It is also measured that the odor intensity is quickly reduced.

When the water paints from both companies are actually applied in a chamber at 24°C at a 60% humidity, the odor of the water paint from company A is lower than that

from company N and also disappears quicker than that from company N after the application.

As a comparative example, each of water paints from companies N and A at 10 g is supplied in an Erlenmeyer flask 21 of 500 ml. After the water paint has been sealed for 10 minutes, generated air is collected in a tetra pack 22 to measure the odor by using a three-point comparing odor measuring method.

In the drawings, reference number 23 refers to a pump for suctioning odor from the Erlenmeyer flask 21 into the tetra pack 22 (refer to Fig.6).

The measuring is carried out by ten panelists. Because the fluctuation by the difference in individuals is large, data indicating a more significant odor intensity of the water paint from company N than that of the water paint from company A cannot be obtained.

#### [Advantageous Effect of the Invention]

According to the invention, the paint is dried as similarly to as in the actual application as the sample to be installed in the sample chamber of the odor measuring device is produced by applying the paint on the plate base piece, thereby making it possible to measure the odor intensity inside the laboratory at a high precision in a short period of time.

The measuring of the odor intensity is also possible with the same paint at various temperatures or humidities whereas the measuring of the change over time after the application is possible. Therefore, optimal conditions for an application can also be predetermined.

#### **4. Brief Description of the Invention**

Fig.1 is a front view illustrating an odor measuring device wherein a paint odor measuring method of the invention is carried out. Fig.2 is a vertical cross-sectional view illustrating a sample chamber for the odor measuring device. Fig.3 is a perspective view illustrating a sample. Fig.4 is a perspective view illustrating the sample being placed in watch glass. Fig.5 illustrates an example for measuring the change of water paints over time. Fig.6 is a perspective view illustrating a test for a comparative example.

A...Sample

1...Odor measuring device body

2...Sample chamber

4...Smell sensor

5...Temperature sensor

6...Humidity sensor

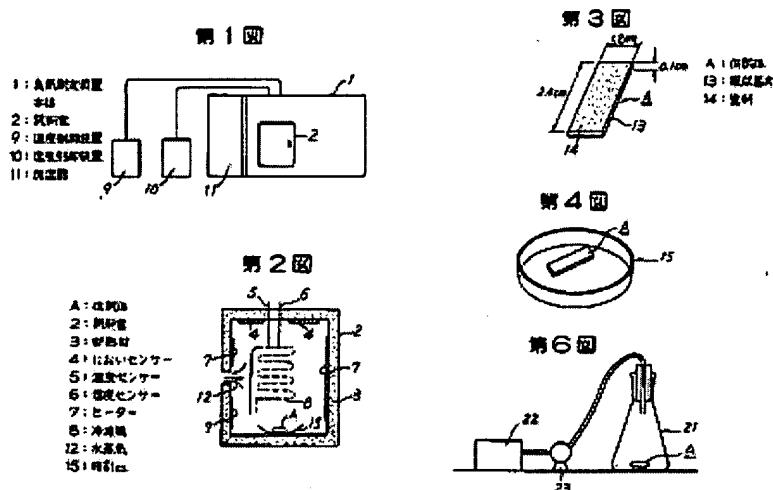
7...Heater

8...Freezer

9...Temperature control device

10...Humidity control device

11...Humidifier



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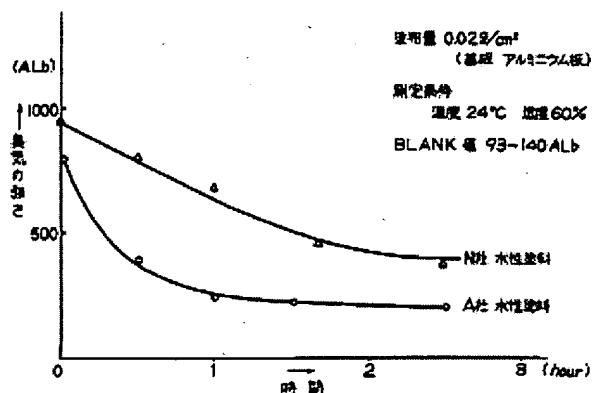


Fig.5:

Vertical axis: Odor intensity

Horizontal axis: Time

Curve with triangles: Water paint from company N

Curve with circles: Water paint from company A

Amount of application: 0.02 g/cm<sup>2</sup> (Substrate: an aluminum plate)

Measuring conditions: Temperature at 24°C; Humidity at 60%

BLANK value: 93 to 140 Alb

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